ATR360N65S-Q1

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	360mΩ@10V	11.5A

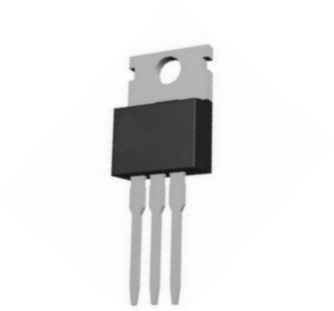
Feature

- New technology for high voltage device
- Low on-resistance and low conduction losses
- small package
- Ultra Low Gate Charge cause lower driving requirements
- Suffix "-Q1" for AEC-Q101

Application

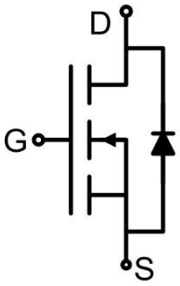
- Power factor correction（PFC）
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply（UPS）

Package



TO-220AB

Circuit diagram



Marking

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Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	11.5	A
Continuous Drain Current(T_C=100℃)	I_D(100℃)	7	A
Pulsed Drain Current[1)]	I_{DM}	46	A
Power Dissipation	P_D	101	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.24	℃/W
Single pulse avalanche energy[2)]	E_{AS}	144	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=25 ℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	650			V
Zero gate voltage drain current(T_C=25℃)	I_{DSS}	V_{DS} =650V,V_{GS} = 0V		0.05	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3.0	3.5	4.0	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =7A		290	360	mΩ
Dynamic characteristics[3)]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V, f =1.0MHz		870		pF
Output Capacitance	C_{oss}			54		
Reverse Transfer	C_{rss}			1.8		
Total Gate Charge	Q_g	V_{DS} =480V,V_{GS} =10V, I_D =11.5A		19		nC
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			6.5		
Turn-on delay time	$t_{d(on)}$	V_{DD}=380V, V_{GS} =10V, I_D =5.5A,R_G=3Ω		11		nS
Turn-on rise time	t_r			8		
Turn-off delay time	$t_{d(off)}$			58		
Turn-off fall time	t_f			9		
Source-Drain Diode characteristics						
Diode Forward Current	I_{SD}	T_C=25℃			11.5	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_{SD}=11.5A,T_j=25°C		0.9	1.2	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =5.8A di/dt = 100A/μs		220		nS
Reverse Recovery Charge	Q_{rr}			2.2		uC
Peak Reverse Recovery Current	I_{rrm}			19		A

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature

2) Tj=25℃,VDD=50V,VG=10V, RG=25Ω

3) Guaranteed by design, not subject to production

Typical Characteristics

Figure1. Safe operating area

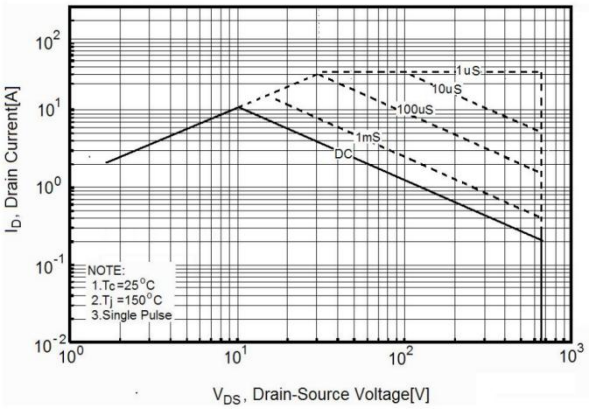


Figure2. Source-Drain Diode Forward Voltage

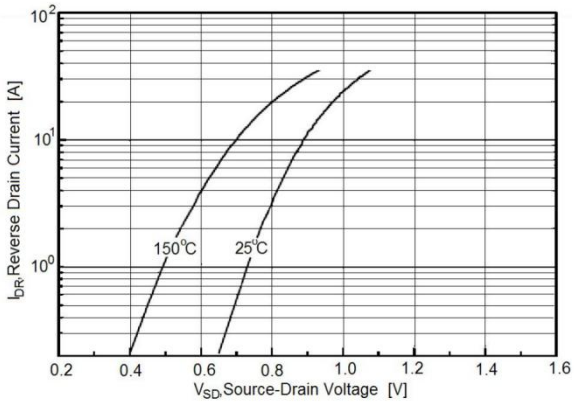


Figure3. Output characteristics

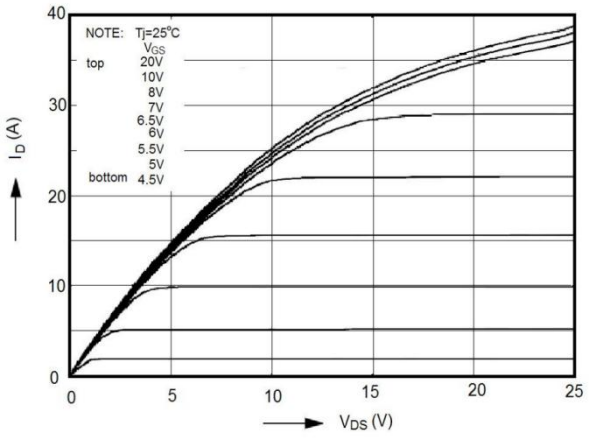


Figure4. Transfer characteristics

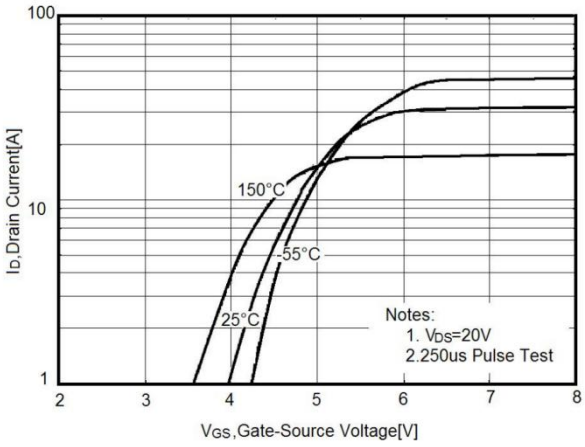


Figure5. Static drain-source on resistance

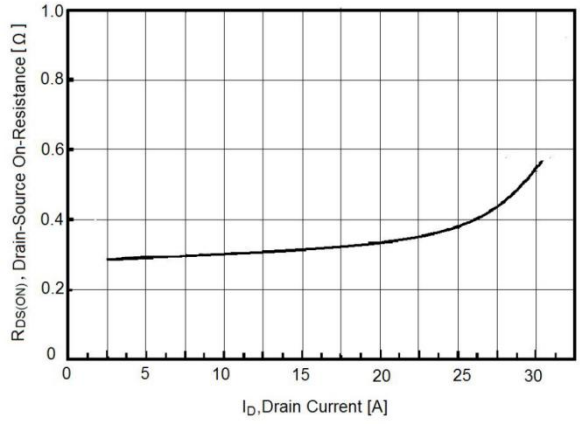
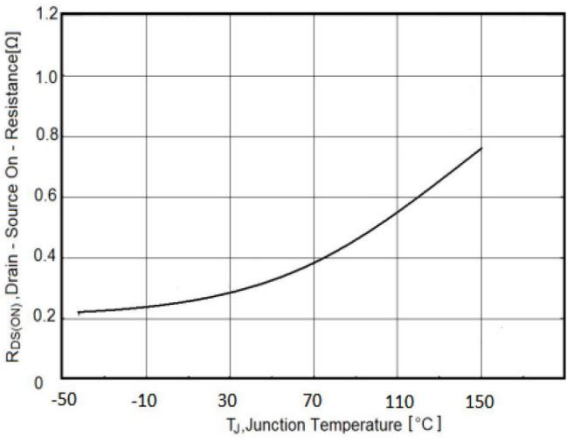


Figure6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DSS} vs Junction Temperature

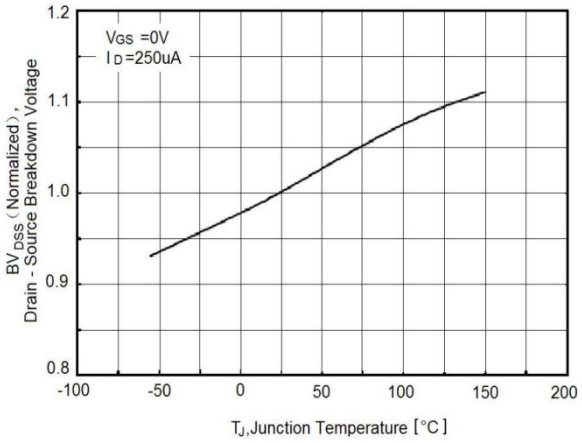


Figure8. Maximum I_D vs Junction Temperature

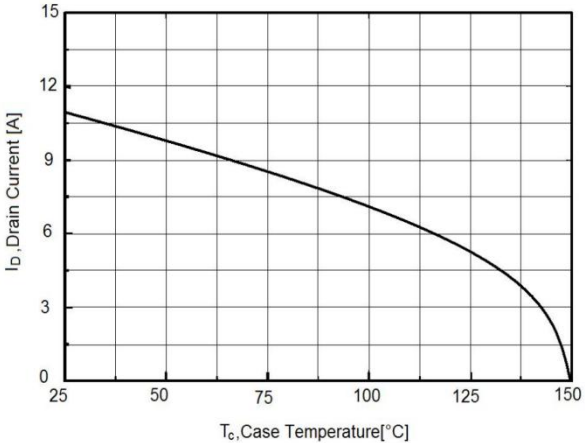


Figure9 . Gate charge waveforms

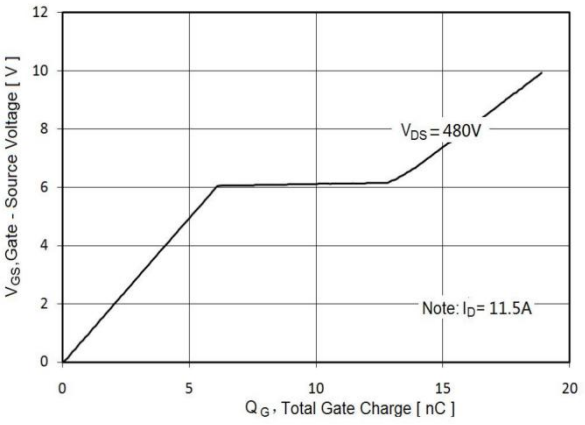


Figure10. Capacitance

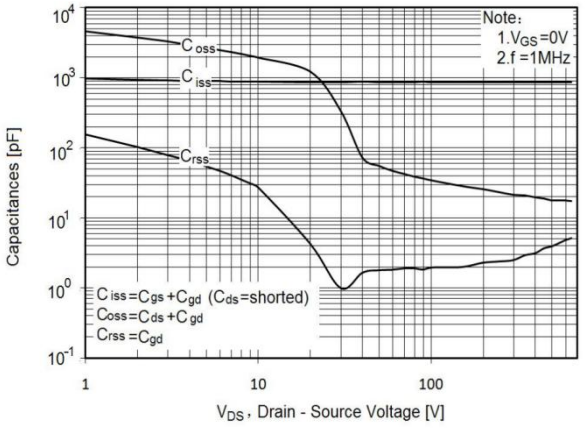
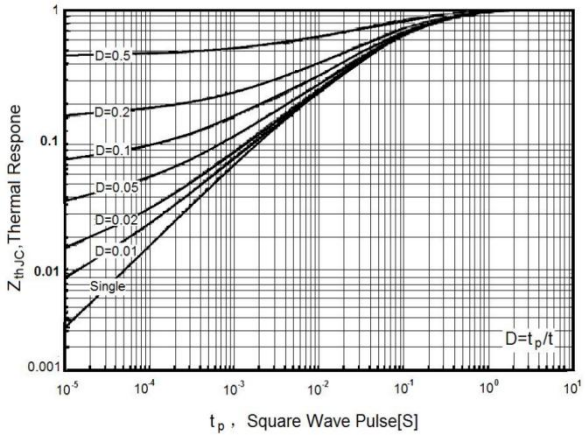
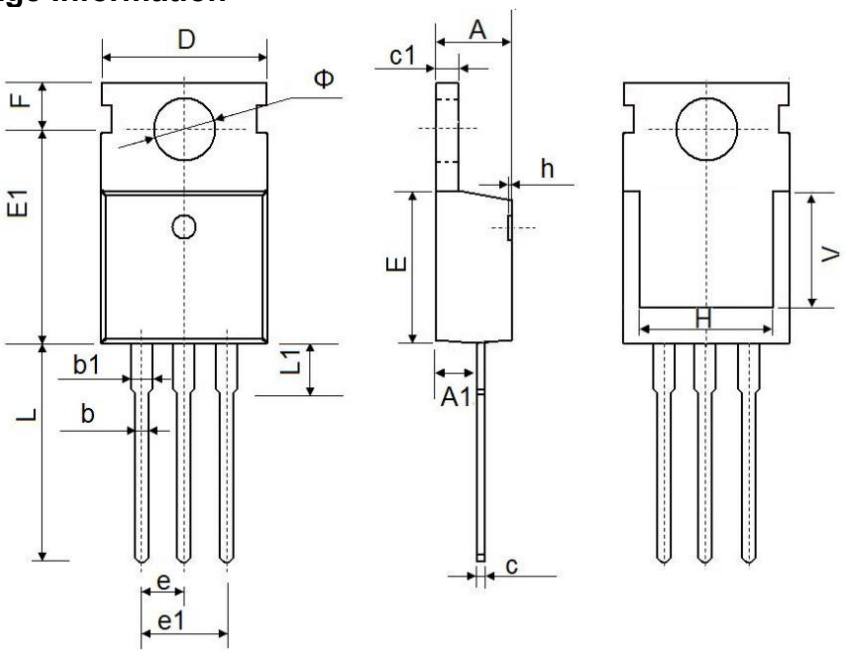


Figure11. Transient Thermal Impedance



TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF		0.295 REF	
Φ	3.400	3.800	0.134	0.150